

WHAT IS CLAIMED IS:

- 1 1. A thermionic electric converter comprising:
 - 2 a casing member;
 - 3 a cathode within said casing member having a cathode emitter operable, when heated, to serve as a source of electrons;
 - 5 a target structure within the casing member comprising an anode operable to receive electrons emitted from the cathode emitter; and
 - 7 a cathode output enhancing device operable to increase an excitation energy of electrons disposed at said cathode emitter.
- 1 2. A thermionic electric converter as set forth in Claim 1 wherein said cathode output enhancing device comprises a cathode enhancing laser positioned to direct a laser beam to strike an emissive surface of said cathode emitter.
- 1 3. A thermionic electric converter as set forth in Claim 2, wherein said cathode enhancing laser is positioned in the interior of said casing member.
- 1 4. A thermionic electric converter as set forth in Claim 3, wherein said cathode enhancing laser is controlled by a rastering device operable to cause the laser beam to sweep across said emissive surface of said cathode.
- 1 5. A thermionic electric converter as set forth in Claim 4, wherein said rastering device is operable to cause the laser beam to sweep across substantially the entire emissive surface of said cathode.

1 6. A thermionic electric converter as set forth in Claim 2 wherein said
2 cathode is positioned at a first side of said anode, and said cathode
3 enhancing laser is positioned at a second side of said anode opposite said
4 first side.

1 7. A thermionic electric converter as set forth in Claim 6, wherein said anode
2 has an opening therein to allow a laser beam emanating from said cathode
3 enhancing laser to pass therethrough.

1 8. A thermionic electric converter as set forth in Claim 7, wherein said
2 opening in said anode is located substantially in a center of said anode.

1 9. A thermionic electric converter as set forth in Claim 7, wherein said target
2 structure further comprises an electron repulsion ring positioned in the
3 opening in said anode, said electron repulsion ring having an opening
4 therethrough.

1 10. A thermionic electric converter as set forth in Claim 9, wherein said
2 electron repulsion ring is joined to said anode by an electrically insulating ring
3 positioned at an edge of said opening in said anode.

1 11. A thermionic electric converter as set forth in Claim 10, wherein said
2 electron repulsion ring is operatively coupled to a source operable to impose a
3 negative charge on said electron repulsion ring.

1 12. A thermionic electric converter as set forth in Claim 7 wherein said target
2 structure further comprises a highly statically charged ring disposed at an
3 outer periphery of said anode.

1 13. A thermionic electric converter as set forth in Claim 12 wherein said
2 anode and said highly statically charged ring are joined together via an inner
3 insulating ring, and wherein said highly statically charged ring has an outer
4 insulating ring adapted to mount said target structure inside said casing
5 member.

1 14. A thermionic electric converter as set forth in Claim 1, wherein said
2 cathode emitter comprises a wire grid having wires going in at least two
3 directions that are transverse to each other.

1 15. A thermionic electric converter as set forth in Claim 1, wherein said anode
2 is a substantially planar plate anode.

1 16. A thermionic electric converter as set forth in Claim 1, further comprising
2 an electron interference laser operable to hit electrons between the cathode
3 and anode.

1 17. A thermionic electric converter as set forth in Claim 2, further comprising
2 an electron interference laser operable to hit electrons between the cathode
3 and anode.

1 18. A thermionic electric converter as set forth in Claim 1 further comprising at
2 least one electret positioned within said casing member and being operable to
3 scavenge stray electrons present within said casing member.

1 19. A thermionic electric converter comprising:
2 a casing member;
3 a cathode within said casing member having a cathode emitter operable,
4 when heated, to serve as a source of electrons,
5 a target structure within the casing member comprising an anode
6 operable to receive electrons emitted from the cathode emitter;
7 a cathode enhancing laser positioned to direct a laser beam to strike an
8 emissive surface of said cathode emitter; and
9 a controller operable to raster said laser beam across said emissive
10 surface of said cathode emitter.

1 20. A thermionic electric converter as set forth in Claim 19, wherein said
2 cathode and said cathode enhancing laser are positioned on opposite sides of
3 said target structure, and
4 wherein said anode has an opening therein to allow a laser beam
5 emanating from said cathode enhancing laser to pass therethrough; and
6 wherein said target structure further comprises an electron repulsion ring
7 positioned at said opening in said anode, and a highly statically charged ring
8 extending around an outer periphery of said anode, operable to aid in
9 attracting electrons in said casing member toward said anode.

1 21. A thermionic electric converter as set forth in Claim 20, further comprising
2 an electron interference laser operable to hit electrons between the cathode
3 and anode.